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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,080	01/12/2005	Magnus Astrom	P04,0495	6617

26574 7590 07/18/2007

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EXAMINER	
GEDEON, BRIAN T	
ART UNIT	**PAPER NUMBER**
3766	

MAIL DATE	DELIVERY MODE
07/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,080	ASTROM ET AL.	
	Examiner	Art Unit	
	Brian T. Gedeon	3766	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/12/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application.
6) ☐ Other: _____.

DETAILED ACTION

1. The rejections made in the previous Office action, dated 12 November 2006, are withdrawn due to the rejections being made against claimed previously cancelled by a preliminary amendment.

Oath/Declaration

2. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not state that the person making the oath or declaration acknowledges the duty to disclose to the Office all information known to the person to be material to patentability as defined in 37 CFR 1.56.

Specifically, the oath/declaration do not have the correct statement with respect to the duty to disclose.

CORRECT STATEMENTS should read:

- "I acknowledge the duty to disclose information which is material to patentability of this application in accordance with Title 37, Code of Federal Regulations Section 1.56."

INCORRECT STATEMENTS:

- "I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations Section 1.56(a)"
- "I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations Section 1.56(a)"
- "I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations Section 1.56"

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 14, 18, 19, 21, and 24-26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley et al. (US Patent no. 5,271,411) in view of Duong-Van (US Patent no. 5,439,483).

In regard to claim 14 and 26, Ripley et al. describe a method and apparatus for ECG signal analysis and arrhythmia detection in which the QRS complex is identified, and features of the complex are extracted and compared to features in a list of clusters that exist in RAM 30, col 8 lines 37-67. Clusters are made when new features not previously detected appear. Cardiac signals, such as the QRS complex are placed in clusters by calculating the distance between the QRS complex's features and each clusters position in the feature space; furthermore the distance between clusters in measured, and compared to a predetermined distance in order to make a determination if the features clusters are appropriately different than the other clusters or if they are too similar in which case the clusters would then be merged, col 9 lines 48-58. The Examiner interprets this to mean that a feature vector (i.e., the position in space and

distance between clusters) is calculated, and is compared to a threshold (i.e., the predetermined distance) in order to help assign features to specific clusters (i.e., whether or not the features of a cluster should be merged or left as a separate cluster). Since Ripley et al. perform the function of the claimed invention; it must necessarily be true that Ripley et al. have structure to serve as the means for performing the said functions. However, Ripley et al. do not disclose the use of wavelet transforms Duong-Van, in a similar field of endeavor, senses electrical signals of the heart, performs wavelet transformations on the sensed data, the analyzes the resultant wavelet transforms in order to classify the data as a particular cardiac event, col 6 lines 50-60. The Examiner looks to Duong-Van to provide the teaching that wavelet transforms can be applied to electrical cardiac signals in order to aid in analysis and classification of the cardiac signal, col 4 lines 16-49. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ripley et al. with the teachings of Duong-Van since Duong-Van teaches that cardiac signal classification/characterization can be enhanced by the use of wavelet transforms.

Further in regard to claim 26, Duong-Van characterizes cardiac signals using wavelet transforms in order to provide electrical therapy during and adverse cardiac event, col 1 lines 6-10 and col 4 lines 36-49. Duong-Van also teaches that this system can be embodied in an implantable cardiac device that contains a pulse generator, wherein the pulse generator is controlled by the data contained in the transformed cardiac signal, col 4 lines 36-49.

In regard to claim 18, Ripley et al. describe the invention as claimed except for the integration of the signal over a predetermined period of time. Duong-Van teaches that in order for the sensed signal to be transformed, the signal must be integrated with respect to time, col 5 lines 26-33. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate over a time period since Duong-Van teaches that the desired information from a wavelet transform is acquired by integrating the signal over a selected time domain.

In regard to claims 19, 20 and 22, Ripley et al. teach that Clusters are made when new features not previously detected appear. Cardiac signals, such as the QRS complex are placed in clusters by calculating the distance between the QRS complex's features and each clusters position in the feature space; furthermore the distance between clusters in measured, and compared to a predetermined distance in order to make a determination if the features clusters are appropriately different than the other clusters or if they are too similar in which case the clusters would then be merged, col 9 lines 48-58

In regard to claim 24, Ripley et al. calculate distances between cluster and cardiac signal in question in order to find the features of the said cardiac signal in order to properly classify it, col 9 lines 1-3.

In regard to claim 21, Ripley et al. terminates clusters that fail to have a predetermined number of cardiac events grouped therein within a predetermined time period, col 9 lines 25-30

In regard to claim 25, Ripley et al. classifies clusters respectively with different cardiac rhythms according to predetermined rules, col 8 lines 37-68.

5. Claims 15-17 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ripley et al. (US Patent no. 5,271,411) in view of Duong-Van (US Patent no. 5,439,483), as applied to claim 1, further in view of li et al. (US PG-Pub 2004/0096100).

In regard to claim 15, Ripley et al. in view of Duong-Van substantially describe the invention as claimed except for the calculation of a covariance matrix to define the respective cluster features. Li et al. describe a method and computer program product for identifying classes of feature space which uses feature extraction, clustering, and feature vector calculations, [0002], [0008], and [0031]. A covariance matrix is calculated as part of the classification process, [0035]. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a covariance matrix since Li et al. teach that it is a necessary calculation for classifying features in clusters of a feature extraction technique.

In regard to claim 16, Ripley et al. in view of Duong-Van substantially describe the invention as claimed, including the calculation of distances between clusters. However, Ripley et al. fail to teach the formula for calculating the distance. Li et al. teach that the Mahalanobis distance criterion is a known formula for aiding in the classification of clusters based on distance calculations, [0050], therefore it would have been obvious to one of ordinary skill in the art.

In regard to claim 17 and 23, Ripley et al. in view of Duong-Van substantially describe the invention as claimed except for using a grid search. However, it would have been obvious in view of Ii et al., because Ii et al. calculate values in a matrix form.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Gedeon whose telephone number is (571) 272-3447. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela D. Sykes can be reached on (571) 272-4955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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